

AD221A, AD222A, and AD393A PCIe 4Gb Fibre Channel and Gigabit Ethernet Combination Card Overview

HP-UX Networking and Mass Storage

HP Integrity Systems

E0408

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Product Overview: AD221A, AD222A, and AD393A

The following cards are described in this overview:

- AD221A PCIe 1p 4Gbit FC and 1p 1000BT Combo Adapter
- AD222A PCIe 2p 4Gbit FC and 2p 1000BT Combo Adapter
- AD393A PCIe 2p 4Gbit FC and 2p 1000Base-SX Combo Adapter

The Fibre Channel portion of these combination cards uses the same protocol and driver as HP's AD355/AD299A 4 Gbit/s Fibre Channel cards. The Gigabit Ethernet portion of these combination cards uses the same protocol and driver as HP's AD337A/AD338A/AD339A Gigabit Ethernet cards.

HP-UX Specifics

HP-UX card specific features include:

- The cards run on HP-UX 11i v3 on specified HP Integrity servers. Each card uses two drivers from the March 2008 release. The Fibre Channel bundle **FibrChanl-02** contains the fclp driver. The Gigabit Ethernet driver bundle **IEther-00** contains the iether driver. The Gigabit Ethernet and Fibre Channel software drivers required for this card will begin shipping with the HP-UX 11i v3 operating environment (OE) of March 2008. Once the drivers have been released on the OE, they will also be available on the twice yearly application software media. For systems that are already running the HP-UX 11i v3 OE, you can either load just the required software driver bundles (**IEther-00** and **FibrChanl-02**), or you can load the entire OE and you will automatically get the drivers you need for this card. If the system does not have the full HP-UX 11i v3 March 2008 Operating Environment installed, additional patches and diagnostics software are required. See the IEther-00 (B.11.31.0803) and FibrChanl-02 (B.11.31.0803) Release Notes for more information.
- Supports HP **Serviceguard** for high availability.
- The cards comply with **PCIe Base Specification Rev. 1.0a** or later. Reduction of Hazardous Substances (RoHS) compliant.
- Supports PCIe online addition/replacement (**OLA/R**) on specified systems. For instructions on performing OL* for Itanium-based systems running HP-UX 11i v 2.0 of September 2004 or later, refer to the *Interface Card OL* Support Guide*. The AD221A, AD222A, and AD393A do not support online addition, replacement, and deletion (OL*) when the card is in the shared slots (slots 3, 4) of rx3600 and rx6600 servers. The card can still be placed in those shared slots as long as no OL* is performed. The cards do not support online deletion on first release.
- Online/Offline Diagnostics.
- Ignite-UX support.
- Supports vPars version 5.03 and later on HP-UX 11i v3. Enables creation of additional partitions per server.

Card Resident EFI

For Fibre Channel, the EFI driver version is 3.21a3 or later. The ISP firmware version is 2.72a2. For Gigabit Ethernet, the EFI driver version is 3.2.06 or later. Please see the "Known Issues" for details on known problems with the EFI driver for these cards.

Fibre Channel Features

The AD221A, AD222A, and AD393A cards have the following Fibre Channel features and requirements:

- FC boot and dump support
- Full compliance with 4Gb FC standard

- Automatic speed sensing to 1Gb/s, 2Gb/s or 4Gb/s and automatic topology detection
- Existing 50/125 µm multimode optical fibre
- Supports the following FC protocols:
 - SCSI-FCP
 - FC-FS
 - FC-PH-2
 - FC-PH-3
 - FC-TAPE
 - FC-PLDA
 - FC-AL-2
 - FCP-2
 - FC-GS-3
- Supports the following topologies:
 - Arbitrated Loop
 - Point to Point
 - Switched (FL_Port and F_Port)

Gigabit Ethernet Features

The AD221A, AD222A, and AD393A cards have the following Gigabit Ethernet features and requirements:

- Supports **Jumbo Frames**. Because Jumbo frames reduce a server's CPU processing of network packets, efficiency increases especially for heavy traffic. The same amount of data can be transferred in less frames. The Jumbo Frame maximum transmission unit (MTU) size is from 1501 to 9000 bytes.
- Supports virtual LANs (**VLANs**) for increased flexibility. A Virtual LAN (VLAN) is a logical or *virtual* network segment that can span multiple physical network segments. VLANs also more efficiently use switches and end-stations by sending broadcasts and multicasts only to the intended nodes. For more information on this feature, please see *Using HP-UX VLANs* on <http://docs.hp.com>.
- Supports Auto-Port Aggregation (**APA**) for load balancing and single-system failover.
- Supports configuration through the NCWeb portion of the System Management Homepage (SMH) or command line `nwmgr` on HP-UX 11i v3.
- On board Checksum Offload (CKO) to enhance server efficiency and performance over TCP, UDP, and IPv4.
- IPv4 TCP Segmentation Offload (TSO). TSO, also known as "large send" enables a system's protocol stack to offload portions of outbound TCP processing to a network interface card thereby reducing system CPU utilization and enhancing performance.
- LAN boot support on HP Integrity systems.

Known Issues

Following is a list of the known problems of the product:

- JAGag47127/QXCR1000591312 -- FC ports not recognized at the EFI level on HP Integrity Superdome sx2000, rx8640, or rx7640 servers. This will be fixed in a forthcoming system firmware update. AD221A/AD222A/AD393A are not supported on HP Integrity Superdome sx2000, rx8640, or rx7640 servers until the system firmware update becomes available.
- JAGag47129 -- EFI ftp put fails with EFI driver. Results in error printed out "snp->undi.transmit() 8000h:4h". The problem only occurs during EFI ftp put (push) not during get (pull). It does not affect LAN boot. It only affects the ability to transfer files out to other systems at the EFI level. This will be fixed in a forthcoming EFI driver update.

Cable Specifications

Operating Distance for 1000Base-T (Copper UTP): Up to 100 meters — Cat 5, Cat 5E, Cat 6

Operating distances for 1000Base-SX using multi-mode fiber optic cable are as follows:

Description (850nm short wavelength laser)	Modal Bandwidth	Operating Distance
50 micron core diameter/ 125micron cladding diameter MMF	400 (MHz * km)	2 to 66 meters (6.56 to 216.48 ft)
	500 (MHz * km)	2 to 82 meters (6.56 to 298.96 ft)
	2000 (MHz * km)	2 to 300 meters (6.56 to 984 ft)

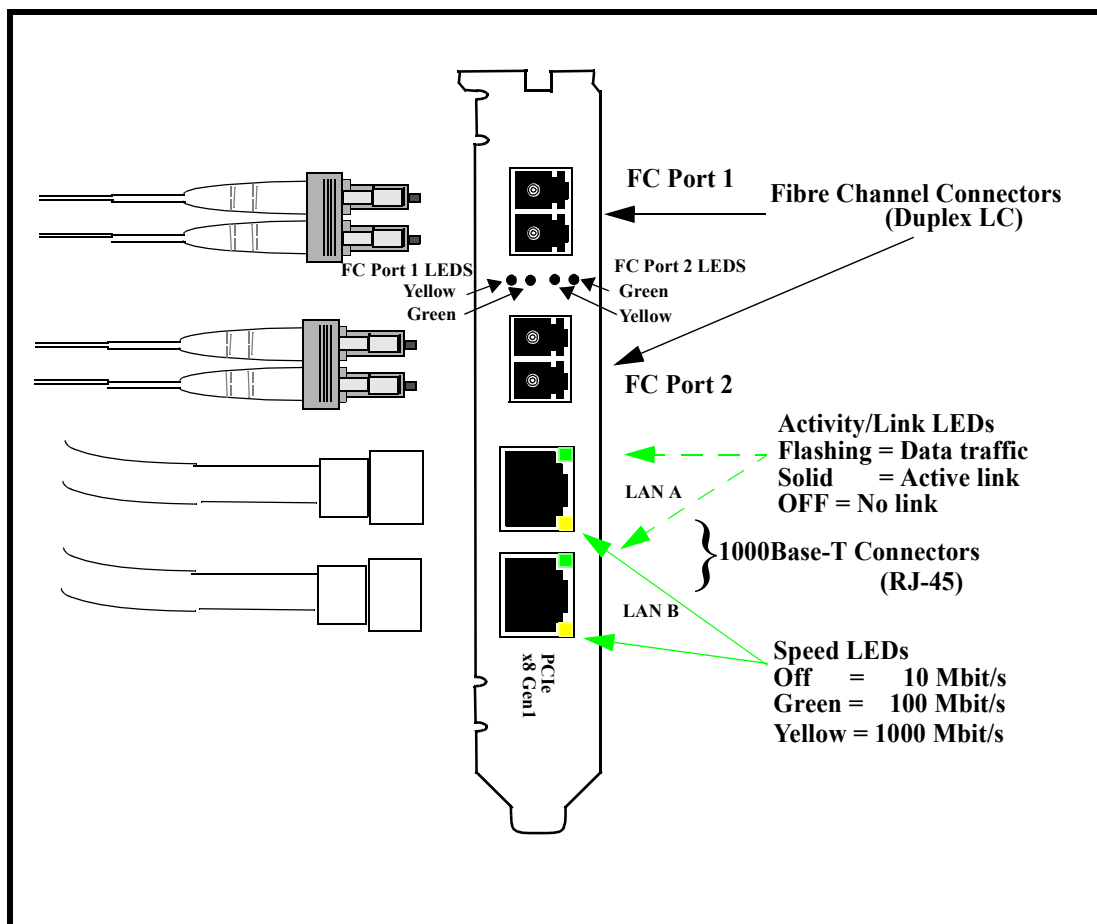
Available HP Fiber Optic Cables:

LC-LC	
221692-B21	2m LC duplex 50/125 Multimode Fibre Channel Cable
221692-B22	5m LC duplex 50/125 Multimode Fibre Channel Cable
221692-B23	15m LC duplex 50/125 Multimode Fibre Channel Cable
221692-B26	30m LC duplex 50/125 Multimode Fibre Channel Cable
221692-B27	50m LC duplex 50/125 Multimode Fibre Channel Cable

Recording the Card Information

Record the serial number and MAC address located on the card for future reference. The MAC address labelled on the card refers to LAN port A. Add 0x1(Hex) to obtain the MAC address for LAN port B. For fibre channel, also record the card's Port and Node worldwide names (WWN). The WWN labelled on each card refers to WWN for FC port 1 (the left port). If it has 2 FC ports, add 0x2(Hex) to obtain the WWN for FC port 2 (the right port).

Figure 1 AD222A PCIe 2-Port 4 Gb FC/ 2-Port 1000B-T Combination Card



The following table shows the meaning of the different Fibre Channel LED patterns:

Table 1 LED Patterns

Yellow	Green LED	Meaning
1 blink	On	Normal Operation (1 Gb link rate, link up)
2 blinks	On	Normal Operation (2 Gb link rate, link up)
3 blinks	On	Normal Operation (4 Gb link rate, link up)
Off	Slow blink	Normal (link down or not started)
Off	Off	Card doesn't have power. Slot not powered, or card failed initialization.
On	Off	POST Failure (dead board)
Slow blink	Off	Wake-Up Failure Monitor
Fast blink	Off	POST Failure
Flashing	Off	POST Process in Progress
Off	On	Failure While Functioning
On	On	Failure While Functioning
Slow blink	Slow blink	Offline for Download
Fast blink	Slow blink	Restricted Offline Mode (waiting for restart)
Flashing	Slow blink	Restricted Offline Mode (test active)

Supporting Systems

For the list of systems that support the cards and the ones that don't, refer to the *Ethernet Support Matrix* and the *Fibre Channel Support Matrix* on <http://docs.hp.com>. Those matrixes also tells which OEs support each card, the driver associated with each card, and the number of cards supported per server.

A Physical, Environmental, and Regulatory Information

This appendix contains regulatory statements for the United States, Canada, Australia/New Zealand, Japan, and the European community.

Card Physical and Environmental Specifications

Following are the product physical and environmental specifications of the PCIe Fibre Channel/Gigabit Ethernet combination card.

Physical Specifications

Form Factor	PCIe standard height card x8 lanes
Width	10.67 cm (4.2 in)
Length	16.7 cm (6.6 in)
Thickness	2.16 cm (0.85 in)

Environmental Specifications

Temperature

Degrees F = (1.8 x Degrees C) + 32

Non-operating/ storage Temperature Range (Degrees Celsius)	-40 to +70
Operating Temperature Range (Degrees Celsius)	+5 to 40
Recommended Operating Temperature Range (Degrees Celsius)	+10 to 40
Temperature Shock Immunity - Max Rate of Change	20 C/hr
Non-operating/storage Humidity Range in %RH	90
Recommended Operating Humidity Range @ 22 Degrees Celsius in %RH	40 to 60
Heat Dissipation (in Watts)	17
Maximum kV (if less than 15 kV) with no loss of function	8
Maximum kV (if less than 25 kV) with no component damage	25
Operating Altitude	3,000 meters (9900) ft
Non-operating Altitude	4,500 meters (14850 ft)

Electromagnetic Compatibility

This document contains regulatory statements for the United States and the European community.

FCC Statement (For U.S.A.)

Federal Communications Commission Radio Frequency Interference Statement

WARNING This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference and
(2) this device must accept any interference received, including interference that might cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and cables, such as those received with your system. Changes or modifications to this equipment not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Canada

Warning: This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe A respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.

EMI Statement (European Community)

NOTE This is a Class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.

Laser Safety Statements

Laser Safety Statements - U.S. FDA/CDRH - Optical (laser) Transceiver

CAUTION The optical transceiver provided on the network interface card contains a laser system and is classified as a “Class-I Laser Product” under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968. The Class I label and compliance statement are located on the optical transceiver.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

CAUTION Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.


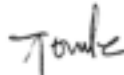
Laser Safety - European Union - Optical Transceiver Only

CAUTION The optical transceiver provided on the network interface card contains a laser system and is classified as a “Class 1 Laser Product” per EN 60825-1, Safety of Laser products. Class 1 laser products are considered safe and do not pose a biological hazard if used within the data sheet limits and instructions.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

CAUTION Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.

There are no user serviceable parts nor any maintenance required for the optical transceiver. All adjustments are made at the factory before shipment to customers. Tampering with or any attempt to modify the optical transceiver will result in voided product warranty. It may also result in improper operation of the network card circuitry and possible overstress of the laser source. Device degradation or product failure may result.

	DECLARATION OF CONFORMITY according to ISO/IEC 17050-1 and EN 17050-1
	DoC #: CPTOJ-0702
Supplier's Name:	Hewlett-Packard Company
Supplier's Address:	8000 Foothills Blvd, Roseville CA 95747 USA
declares, that the product	
Product Name and Model:	HP PCIe 1P 4Gb FC AND 1P 1000BT Adptr, AD221A HP PCIe 2P 4Gb FC AND 2P 1000BT Adptr, AD222A
Regulatory Model Number:¹⁾	CPTOJ-0702
Product Options:	All
conforms to the following Product Specifications and Regulations:	
EMC: Class A CISPR 24:1997 + A1:2001 + A2:2002 CISPR 24:1997 + A1:2001 + A2:2002 FCC CFR 47 Part 15 AS/NZS CISPR 22:2004/EN 55022:1994 + A1:1995 + A2:1997 EN 55022:1998 + A1:2000 + A2:2003 EN 55024:1998 + A1:2001 + A2:2003	
Safety: EN 60950-1:2001 CNS 14336 2004 EN 60825-1:1994 + A1:2002 + A2:2001 AS/NZS 60950.1:2003	
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The product herewith complies with the requirements of the Low Voltage Directive 2006/95/EC, the EMC Directive 2004/108/EC and carries the CE-marking accordingly.	
Additional Information: 1) This product is assigned a Regulatory Model Number which stays with the regulatory aspects of the design. The Regulatory Model Number is the main product identifier in the regulatory documentation and test reports, this number should not be confused with the marketing name or the product numbers.	
Cupertino CA, March 31, 2008	 Tom Le, Hardware Engineer
Local contact for regulatory topics only: EMEA: Hewlett-Packard GmbH, HQ-TRE, Hertenberger Strasse 140, 71034 Bowdlingen, Germany www.hp.com/go/certificates U.S.: Hewlett-Packard, 3000 Hanover St., Palo Alto 94304, U.S.A. 650857-1501	



DECLARATION OF CONFORMITY
according to ISO/IEC 17050-1 and EN 17050-1

DoC #: CPTOJ-0703

Supplier's Name: Hewlett-Packard Company
Supplier's Address: 8000 Foothills Blvd, Roseville CA 95747 USA
declares, that the product
Product Name and Model: HP PCIe 2P 4Gb FC AND 2P 1000SX Adptr, AD393A
Regulatory Model Number:¹⁾ CPTOJ-0702
Product Options: All

conforms to the following Product Specifications and Regulations:

EMC: Class A
CISPR 24:1997 + A1:2001 + A2:2002
CISPR 24:1997 + A1:2001 + A2:2002
FCC CFR 47 Part 15
AS/NZS CISPR 22:2004EN 55022:1994 + A1:1995 + A2:1997
EN 55022:1998 + A1:2000 + A2:2003
EN 55024:1998 + A1:2001 + A2:2003

Safety:
EN 60950-1:2001
CNS 14336 2004
EN 60825-1:1994 + A1:2002 + A2:2001
AS/NZS 60950.1:2003

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
The product herewith complies with the requirements of the Low Voltage Directive 2006/95/EC, the EMC Directive 2004/108/EC and carries the CE-marking accordingly.

Additional Information:

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Cupertino CA March
31, 2008

Tom Le,
Hardware Engineer

Local contact for regulatory topics only:
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U.S.: Hewlett-Packard, 3000 Hanover St., Palo Alto 94304, U.S.A. 650-857-1501